IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	Ole SIBBESEN *et al.*	Filed via EFS Web October 15, 2009
Title:	BACTERIAL XYLANASES	
Appl. No.:	10/626,583	
Filing Date:	July 25, 2003	
Examiner:	Ganapathiram RAGHU	
Art Unit:	1652	
Confirmation Number:	9539	

REPLY BRIEF UNDER § 41.41

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Sir:

Under the provisions of 37 C.F.R. § 41.41, and in response to the Examiner's Answer mailed on August 17, 2009 ("Examiner's Answer"), Appellants submit this Reply Brief. The due date for filing this response is **October 17, 2009**, and so this brief is considered timely filed.

Authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741 if any fees are due.

I. ARGUMENT

Appellants wish to respond to some of the assertions made in the Examiner's Answer, dated August 17, 2009.

A. The Cited Art Teaches Away from the Claimed Invention

The Examiner makes several statements in the Examiner's Answer regarding the reference by Maat *et al.*, "Xylanases and their application in bakery," XYLANS AND XYLANASES, ed. J. Visser *et al.* Elsevier:349-360 (1992) ("Maat"), which mischaracterize the reference. The statements were made to support the Examiner's contention that Maat, as well as the cited art, does not teach away from the use of bacterial xylanases. Examiner's Answer at 18-19[1]. First, the Examiner states that:

> [T]he interpretation by the Appellants that Maat et al., teaches away from the use of bacterial xylanase in **not agreed**. In fact, the xylanase isolated by Maat et al., had **considerable homology to bacterial xylanases** (page 357).

Examiner's Answer at 18-19 (emphasis in original). Appellants agree that Maat states that the "DNA derived protein sequence shows a considerable homology (ca. 50%) with xylanases from B. circulans, B. pumilis, and C.acetobutylicum," which are all bacterial xylanases. Maat at 349. However, Maat's statement that a 50% homology between two sequences is "considerable" relates to the conclusion that the fungal xylanase of Maat as compared to other bacterial xylanases provides evidence that Maat's protein is indeed a xylanase. *See* Maat at bottom of 355-356. Thus, the statement in Maat regarding considerable homology was for the purpose of identifying the predicted protein *as a xylanase*. Indeed 50% homology, is not

[1] Appellants note that similar comments regarding Maat were also made in other sections of the Examiner's Answer, in response to other arguments. *See, e.g.*, Examiner's Answer at 13-14 and 16.

considerable homology when trying to predict the *function* of a protein. Therefore, the Examiner is misleading in his conclusion that one of ordinary skill in the art would have concluded that based on 50% homology, bacterial xylanases would have the *same activity and effect* on dough stickiness as a fungal xylanase. This is because a 50% level of homology, which may be sufficient to categorize a protein as specific class of enzyme (*i.e.*, a xylanase), is not sufficient to predict the activity and function of a protein.

Additionally, the Examiner maintains that Maat, considered in its entirety, "emphasizes the use of highly purified recombinant xylanase irrespective of the source." Examiner's Answer at 18. However, the Examiner's conclusion again is misleading. Maat discusses xylanases derived from fungal and bacterial sources and there is no statement or suggestion in Maat that the use of a highly purified form of these xylanases would reduce dough stickiness. Indeed, Maat states that dough stickiness is observed in ***xylanases*** derived from other fungal or bacterial sources:

> We have identified a particular β-1,4-xylanase produced by Aspergillus niger var. awamori strain as being very effective in increasing the specific volume of breads, without giving rise to a negative side effect on dough handling (dough stickiness) as can be observed with **xylanases derived from other fungal or bacterial sources**.

Maat at 349 (emphasis added). This statement would suggest the *direct opposite* of what the Examiner concludes. Specifically, Maat teaches only that a very specific xylanase (β-1,4-xylanase from *A. niger*) does not give rise to dough stickiness when compared to other ***fungal or bacterial xylanases***. Maat is silent regarding whether or not the other fungal or bacterial xylanases are "highly purified recombinant" xylanases. However, the statement that bacterial xylanases result in dough stickiness is clear.

Finally, the Examiner states that Maat focused on fungal xylanases because "said organism was a high producer of the desired xylanase compared to other xylanases." Examiner's Answer at 18. However, a reading of Maat reveals that the *strain* of fungus, was chosen for this reason. Indeed, Maat screened only fungal sources for the highest producing strain:

> From a screening of xylanase producers...**of fungal origin**, an Aspergillus niger var. awamori was selected. **This strain** produced the correct type of xylanase in relatively high amounts as compared to other xylanases.

Maat at 355 (emphasis added); *see also* Maat at 350 ("[W]e have embarked on the analysis of fungal enzyme preparations."). Fungal xylanases would have been studied at the time of Maat because fungal enzymes had been shown to have a positive effect on bread. *See* Maat at 350 ("[E]nzymes from...microbial (fungal) origin have been shown to positively influence the bread volume....") and paragraph [0010]-[0012] of US 2004/0234998 (which corresponds to the present application). Thus, the Examiner again mischaracterizes the reference.

Appellants maintain that Maat teaches away from the use of bacterial xylanases, as it was known in the art that bacterial xylanases cause dough stickiness.

Thus, for these reasons and those already of record, the Board should reverse the present rejection.

Respectfully submitted,

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